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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/925,153	08/08/2001	Fumihiko Nakamura	09792909-5122	3081

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EXAMINER

BLUM, DAVID S

ART UNIT PAPER NUMBER

2813

DATE MAILED: 08/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/925,153

Applicant(s)

NAKAMURA ET AL.

Examiner

David S Blum

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 August 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,2,4-16 and 18-27 is/are pending in the application.
- 4a) Of the above claim(s) 6-12 and 20-27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,5,13-16,18 and 19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1,2,4-16 and 18-27 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 August 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

This action is in response to Response paper #18, filed 08/11/03.

## **DETAILED ACTION**

### ***Drawings***

1. The corrected or substitute drawings were received on 08/11/03. These drawings are accepted.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-2, 4-5, 13-16, and 18-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Toshiyuki (JP 10-424586).

Toshiyuki teaches the device of claims 1-2,4-5,13-16, and 18-19 in that a buffer layer of GaN (a type III-V) compound semiconductor (as in claim 19) is heavily doped (substantially) with cadmium (abstract and paragraphs 0011 and 0022). The dopant concentration is  $2 \times 10^{15}$  to  $2 \times 10^{17}$  as in claims 4 and 18 (not less than  $1 \times 10^{17}$ ) (paragraph 0022). As other dopants may be  $1 \times 10^{15}$  to  $1 \times 10^{17}$ , (paragraph 0011), the range teaches the layer to be doped mostly with cadmium as in claims 5 and 13. Paragraph 0003 teaches that the device may be used as a light-emitting device as in claim 14.

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Regarding claim 15, which limits the device to having an active layer on the insulating nitride layer, the specification (page 18) describes this layer as GaN layer 4. Toshiyuki forms a GaN layer (4) over the buffer layers. As the layers are of the same material and in the same location, the layer must also be an active layer.

### ***Response to Arguments***

4. Applicant's arguments filed 08/11/03 have been fully considered but they are not persuasive.

The applicant argues that Toshiyuki does not form a buffer layer of group III-V heavily doped with cadmium, but rather a cladding layer and that layer being only lightly doped with cadmium.

Toshiyuki clearly refers to the layer as a buffer layer (abstract). The level of cadmium in claims 1 and 13 is not defined, therefore even a second impurity may read on "heavily doped". Further, the level of first impurity is  $1 \times 10^{17}$  to  $2 \times 10^{19}$  (paragraph 0012 and applicant's arguments), which is within the limitations of claims 4 and 18. Also, cadmium may be substituted for magnesium in the concentration level of  $2 \times 10^{15}$  to  $2 \times 10^{17}$  (paragraph 0022), which is within the limitations of claims 3 and 18.


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5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Blum whose telephone number is (703)-306-9168 and e-mail address is [David.blum@USPTO.gov](mailto:David.blum@USPTO.gov) .

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr., can be reached at (703)-308-4940. Our facsimile number for Before-Final Communications is (703)- 872-9318 and for After-Final Communications is (703)- 872-9319. The facsimile number for customer service is (703)-872-9317. Our receptionist's number is (703)-308-0956.

David S. Blum

August 20, 2003

  
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